76-1586

7 OCT 1976

Executive Registry
76-5406

MEMORANDUM FOR: Executive Advisory Group Members

SUBJECT : Minutes of the 30 September 1976 Executive Advisory Group Meeting

1. The Executive Advisory Group (EAG) met on 30 September to discuss: a. a paper (EAG 10) prepared by [redacted] of the Comptroller's Office concerning management arrangements for joint [redacted] and b. a paper on the Agency's management process (EAG 3/f) prepared by the Comptroller outlining 37 major questions to be pursued by the EAG in coming months. 25X1 25X1

2. With respect to [redacted] paper, after considerable discussion of the kinds of management review to which [redacted] collection programs should be subjected, Mr. Knoche agreed to prepare a short list of criteria to be used in formulating a new approach to the management of technical collection activities, emphasizing project management. (Mr. Knoche subsequently provided these criteria to the Comptroller and asked that [redacted] prepare a paper incorporating these points for further review, coordinating that paper with DDO and DDS&T.) 25X1 25X1 25X1

3. With respect to the paper on Agency management processes, Mr. Knoche asked Mr. Taylor to consolidate certain of the issues, to arrange an EAG presentation on the Agency's ADP programs, and to continue to schedule EAG meetings in pursuit of the major questions identified. He emphasized the need to involve other Agency personnel in the preparation of analysis of questions for EAG review and asked Mr. Taylor to work with the Deputies to arrange for such participation.

[redacted] 25X1

James H. Taylor
Secretary
Executive Advisory Group

25X1 cc: [redacted] [redacted] 25X1

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3	Secretary, Executive Advisory Group	7 OCT 1976	QT
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	COMMENT		FILE		RETURN
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Remarks:

Pursuant to your telephone request of 6 October, [redacted] has been contacted and agreed to appear at the EAG meeting of Thursday, 14 October 1976 at 1530, to provide a 10 or 15 minute briefing on the problem of interpreting new guidelines.

25X1

cc: [redacted]

25X1

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TO	NAME AND ADDRESS	DATE	INITIALS
1	(2) ER Attn: (1) Mr. Evans	8 Aug	
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76-1533

4 OCT 1976

MEMORANDUM FOR: Executive Advisory Group Members

SUBJECT : Minutes of the 28 September 1976 Executive Advisory Group Meeting

The Executive Advisory Group (EAG) met on Tuesday, 28 September 1976, to review counterintelligence programs of the CIA staff and to discuss the counterintelligence function generally, with particular reference to problems which arise out of implementation of E. O. 11905. [redacted] outlined present activities and problems in counterintelligence. At the end of the discussion, Mr. Knoche asked: that the DDO review the commitment of resources to the counterintelligence problem; that DDO and DDS&T meet to discuss possible further counter-intelligence efforts in support of [redacted] overseas; and that Mr. Malanick task Mr. Fitzwater to consider additional training activities in support of the counterintelligence function. 25X1 25X1

[redacted] 25X1

James H. Taylor
Secretary
Executive Advisory Group

25X1 cc: [redacted]

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CENTRAL INTELLIGENCE AGENCY

Executive Registry
76-3555/1

27 September 1976

N. M. F
who should it be?

NOTE FOR: EAG Members

FROM : E. H. Knoche, DDCI

This article speaks for itself. I found it fascinating and assume you will, too. It raises questions as to the wisdom of adopting an overly cumbersome planning and management system and it is for that reason alone worth our attention.

I would be interested in your reactions.

[redacted]
E. H. Knoche

25X1

Attachment:
Harvard Business Review article, "Planning on the Left Side and Managing on the Right."

Distribution

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DDCI:me/27 Sep 76

ROUTING AND RECORD SHEET

SUBJECT: (Optional)

Executive Registry
76-3555/2

25X1

FROM:
DDO

NO. basic + 1 attached

DATE 30 September 1976

TO: (Officer designation, room number, and building)	DATE RECEIVED	DATE FORWARDED	OFFICER'S INITIALS	COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)
1. DDCI	30 Sep	1 Oct		The Harvard Business Review article is fascinating. I am a right hemisphere type, of that there is no doubt. A lot of folks, however, may become schizophrenic if they sit and try to figure out just what they are. It will also be great for cocktail party conversation.
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Planning on the left side and managing on the right

Henry Mintzberg

Which hemisphere of one's brain is better developed may determine whether a person ought to be a planner or a manager

Did you ever wonder why some things come so easily and others seem so difficult, why sometimes you just cannot get your brain to work? Maybe the problem is not that you are stupid or tired, but that you are tackling a problem that taxes the least developed hemisphere of your brain. Recent scientific research shows that the human brain is specialized, the logical, linear functions occurring in the left hemisphere, and the holistic, relational ones occurring in the right. The author of this article maintains that this finding has great implications for both the science and art of management. For instance, in an organization, the author suggests that the top managers should have well developed right-hemispheric processes, and the planners well developed left-hemispheric processes. Perhaps the most important conclusion he arrives at is that the functions and capacities of the two hemispheres should both be respected, but that one should not be confused or applied where the other is better suited.

Mr. Mintzberg is a professor in the Faculty of Management at McGill University, Montreal, Canada. He is currently visiting professor at Centre d'Etude et de Recherche sur les Organisations et la Gestion (I.A.E.) in Aix-en-Provence, France. He has written extensively on the manager and his work, and is the author of HBR's McKinsey Award winning article for 1975, "The Manager's Job: Folklore and Fact," which appeared in the July-August issue.

In the folklore of the Middle East, the story is told about a man named Nasrudin, who was searching for something on the ground. A friend came by and asked: "What have you lost, Nasrudin?"

"My key," said Nasrudin.

So, the friend went down on his knees, too, and they both looked for it. After a time, the friend asked: "Where exactly did you drop it?"

"In my house," answered Nasrudin.

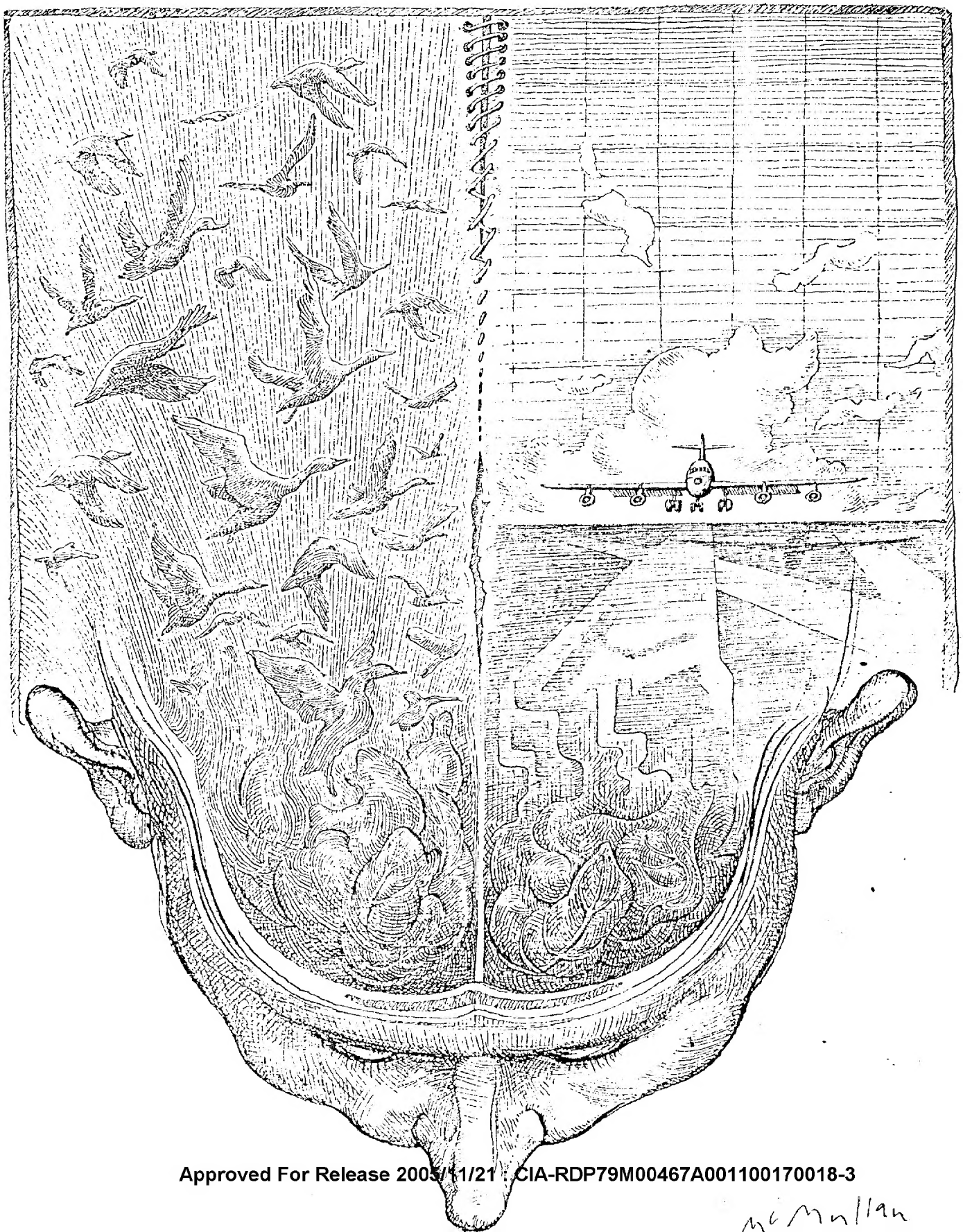
"Then why are you looking here, Nasrudin?"

"There is more light here than inside my own house."

This "light" little story is old and worn, yet it has some timeless, mysterious appeal, one which has much to do with the article that follows. But let me leave the story momentarily while I pose some questions—also simple yet mysterious—that have always puzzled me.

□

First: Why are some people so smart and so dull at the same time, so capable of mastering certain mental activities and so incapable of mastering others? Why is it that some of the most creative thinkers cannot comprehend a balance sheet, and that some accountants have no sense of product de-



McMullan

sign? Why do some brilliant management scientists have no ability to handle organizational politics, while some of the most politically adept individuals cannot seem to understand the simplest elements of management science?

□

Second: Why do people sometimes express such surprise when they read or learn the obvious, something they already must have known? Why is a manager so delighted, for example, when he reads a new article on decision making, every part of which must be patently obvious to him even though he has never before seen it in print?

□

Third: Why is there such a discrepancy in organizations, at least at the policy level, between the science and planning of management on the one hand, and managing on the other? Why have none of the techniques of planning and analysis really had much effect on how top managers function?

What I plan to do in this article is weave together some tentative answers to these three questions with the story of Nasrudin around a central theme, namely, that of the specialization of the hemispheres of the human brain and what that specialization means for management.

The two hemispheres of the human brain

Let us first try to answer the three questions by looking at what is known about the hemispheres of the brain.

Question one

Scientists—in particular, neurologists, neurosurgeons, and psychologists—have known for a long time that the brain has two distinct hemispheres. They have known, further, that the left hemisphere controls movements on the body's right side and that the right hemisphere controls movements on the left. What they have discovered more recently, however, is that these two hemispheres are specialized in more fundamental ways.

In the left hemisphere of most people's brains (left-handers largely excepted) the logical thinking processes are found. It seems that the mode of operation of the brain's left hemisphere is linear; it processes information sequentially, one bit after another, in an ordered way. Perhaps the most obvious linear faculty is language. In sharp contrast, the right hemisphere is specialized for simultaneous processing; that is, it operates in a more holistic, relational way. Perhaps its most obvious faculty is comprehension of visual images.

Although relatively few specific mental activities have yet been associated with one hemisphere or the other, research is proceeding very quickly. For example, a recent article in *The New York Times* cites research which suggests that emotion may be a right-hemispheric function.[1] This notion is based on the finding that victims of right-hemispheric strokes are often comparatively untroubled about their incapacity, while those with strokes of the left hemisphere often suffer profound mental anguish.

What does this specialization of the brain mean for the way people function? Speech, being linear, is a left-hemispheric activity, but other forms of human communication, such as gesturing, are relational rather than sequential and tend to be associated with the right hemisphere. Imagine what would happen if the two sides of a human brain were detached so that, for example, in reacting to a stimulus, a person's words would be separate from his gestures. In other words, the person would have two separate brains—one specialized for verbal communication, and the other for gestures—that would react to the same stimulus.

This "imagining," in fact, describes how the main breakthrough in the recent research on the human brain took place. In trying to treat certain cases of epilepsy, neurosurgeons found that by severing the corpus callosum, which joins the two hemispheres of the brain, they could "split the brain," isolating the epilepsy. A number of experiments run on these "split-brain" patients produced some fascinating results.

In one experiment doctors showed a woman epileptic's right hemisphere a photograph of a nude woman. (This is done by showing it to the left half of each eye.) The patient said she saw nothing, but almost simultaneously blushed and seemed confused and uncomfortable. Her "conscious" left hemisphere, including her verbal apparatus, was aware only that something had happened to her body, but

1. Richard Restak, "The Hemispheres of the Brain Have Minds of Their Own," *New York Times*, 25 January 1976.

not of what had caused the emotional turmoil. Only her "unconscious" right hemisphere knew. Here neurosurgeons observed a clear split between the two independent consciousnesses that are normally in communication and collaboration.[2]

Now, scientists have further found that some common human tasks activate one side of the brain while leaving the other largely at rest. For example, a person's learning a mathematical proof might evoke activity in the left hemisphere of his brain, while his conceiving a piece of sculpture or assessing a political opponent might evoke activity in his right.

So now we seem to have the answer to the first question. An individual can be smart and dull at the same time simply because one side of his or her brain is more developed than the other. Some people—probably most lawyers, accountants, and planners—have better developed left-hemispheric thinking processes, while others—artists, sculptors, and perhaps politicians—have better developed right-hemispheric processes. Thus an artist may be incapable of expressing his feelings in words, while a lawyer may have no facility for painting. Or a politician may not be able to learn mathematics, while a management scientist may constantly be manipulated in political situations.

Eye movement is apparently a convenient indicator of hemispheric development. When asked to count the letters in a complex word such as *Mississippi* in their heads, most people will gaze off to the side opposite their most developed hemisphere. (Be careful of lefties, however.) But if the question is a specialized one—for example, if it is emotionally laden, spatial, or purely mathematical—the number of people gazing one way or another will change substantially.

Question two

A number of word opposites have been proposed to distinguish the two hemispheric modes of "consciousness," for example: explicit versus implicit; verbal versus spatial; argument versus experience; intellectual versus intuitive; and analytic versus gestalt.

I should interject at this point that these words, as well as much of the evidence for these conclusions, can be found in the remarkable book entitled *The Psychology of Consciousness* by Robert Ornstein, a research psychologist in California. Ornstein uses the story of Nasrudin to further the points he is making. Specifically, he refers to the linear left hemisphere as synonymous with lightness, with thought processes that we know in an explicit sense. We can *articulate* them. He associates the right hemisphere with darkness, with thought processes that are mysterious to us, at least "us" in the Western world.

Ornstein also points out how the "esoteric psychologies" of the East (Zen, Yoga, Sufism, and so on) have focused on right-hemispheric consciousness (for example, altering pulse rate through meditation). In sharp contrast, Western psychology has been concerned almost exclusively with left-hemispheric consciousness, with logical thought. Ornstein suggests that we might find an important key to human consciousness in the right hemisphere, in what to us in the West is the darkness. To quote him:

"Since these experiences [transcendence of time, control of the nervous system, paranormal communication, and so on] are, by their very mode of operation, not readily accessible to causal explanation or even to linguistic exploration, many have been tempted to ignore them or even to deny their existence. These traditional psychologies have been relegated to the 'esoteric' or the 'occult,' the realm of the mysterious—the word most often employed is 'mysticism.' It is a taboo area of inquiry, which has been symbolized by the Dark, the Left side [the right hemisphere] of ourselves, the Night." [3]

Now, reflect on this for a moment. (Should I say meditate?) There is a set of thought processes—linear, sequential, analytical—that scientists as well as the rest of us know a lot about. And there is another set—simultaneous, relational, holistic—that we know little about. More importantly, here we do not "know" what we "know" or, more exactly, our left hemispheres cannot articulate explicitly what our right hemispheres know implicitly.

2. Robert Ornstein, *The Psychology of Consciousness* (San Francisco: W.H. Freeman, 1975), p. 60.

3. Ibid., p. 197.

4. These findings are based on (a) my observational study of the work of five chief executives reported in *The Nature of Managerial Work* (New York: Harper and Row, 1973) and in "The Manager's Job: Folklore and Fact" (HBR July-August 1975, p. 49); (b) a study of twenty-five strategic decision processes reported in "The Structure of 'Unstructured' Decision Processes," coauthored with Duru Raisinghani and André Théorêt, to appear in a forthcoming issue of [illegible]; and (c) a series of studies carried out under my supervision at McGill University on the formation of organizational strategies over periods of decades, reported in "Patterns in Strategy Formation," Working Paper, I.A.E., Aix-en-Provence,

So here is, seemingly, the answer to the second question as well. The feeling of revelation about learning the obvious can be explained with the suggestion that the "obvious" knowledge was implicit, apparently restricted to the right hemisphere. The left hemisphere never "knew." Thus it seems to be a revelation to the left hemisphere when it learns explicitly what the right hemisphere knew all along implicitly.

Now only the third question—the discrepancy between planning and managing—remains.

Question three

By now, it should be obvious where my discussion is leading (obvious, at least, to the reader's right hemisphere and, now that I write it, to the reader's left hemisphere as well). It may be that management researchers have been looking for the key to management in the lightness of logical analysis whereas perhaps it has always been lost in the darkness of intuition.

Specifically, I propose that there may be a fundamental difference between formal planning and informal managing, a difference akin to that between the two hemispheres of the human brain. The techniques of planning and management science are sequential and systematic; above all, articulated. Planners and management scientists are expected to proceed in their work through a series of logical, ordered steps, each one involving explicit analysis. (The argument that the successful application of these techniques requires considerable intuition does not really change my point. The occurrence of intuition simply means that the analyst is departing from his science, as it is articulated, and is behaving more like a manager.)

Formal planning, then, seems to use processes akin to those identified with the brain's left hemisphere. Furthermore, planners and management scientists seem to revel in a systematic, well-ordered world, and many show little appreciation for the more relational, holistic processes.

What about managing? More exactly, what about the processes used by top managers? (Let me emphasize here that I am focusing this discussion at the policy level of organizations, where I believe the dichotomy between planning and managing is most sharp.) Managers plan in some ways, too, (that is, they think ahead) and they engage in their share of logical analysis. But I believe there is more than that to the effective managing of an organization. I hypothesize, therefore, that *the important policy processes of managing an organization rely to a considerable extent on the faculties identified with the brain's right hemisphere.* Effective managers seem to revel in ambiguity; in complex, mysterious systems with relatively little order.

If true, this hypothesis would answer the third question about the discrepancy between planning and managing. It would help to explain why each of the new analytic techniques of planning and analysis has, one after the other, had so little success at the policy level. PPBS, strategic planning, "management" (or "total") information systems, and models of the company—all have been greeted with great enthusiasm; then, in many instances, a few years later have been quietly ushered out the corporate back door. Apparently none served the needs of decision making at the policy level in organizations; at that level other processes may function better.

Managing from the right hemisphere

Because research has so far told us little about the right hemisphere, I cannot support with evidence my claim that a key to managing lies there. I can only present to the reader a "feel" for the situation, not a reading of concrete data. A number of findings from my own research on policy-level processes do, however, suggest that they possess characteristics of right-hemispheric thinking.[4]

One fact recurs repeatedly in all of this research: the key managerial processes are enormously complex and mysterious (to me as a researcher, as well as to the managers who carry them out), drawing on the vaguest of information and using the least articulated of mental processes. These processes seem to be more relational and holistic than ordered and sequential, and more intuitive than intellectual; they seem to be most characteristic of right-hemispheric activity.

Here are ten general findings:

1. The five chief executives I observed strongly favored the verbal media of communication, especially meet-

ings, over the written forms, namely reading and writing. (The same result has been found in virtually every study of managers, no matter what their level in the organization or the function they supervised.) Of course verbal communication is linear, too, but it is more than that. Managers seem to favor it for two fundamental reasons that suggest a relational mode of operation.

First, verbal communication enables the manager to "read" facial expressions, tones of voice, and gestures. As I mentioned earlier, these stimuli seem to be processed in the right hemisphere of the brain. Second, and perhaps more important, verbal communication enables the manager to engage in the "real-time" exchange of information. Managers' concentration on the verbal media, therefore, suggests that they desire relational, simultaneous methods of acquiring information, rather than the ordered and sequential ones.

2

In addition to noting the media managers use, it is interesting to look at the content of managers' information, and at what they do with it. The evidence here is that a great deal of the manager's inputs are soft and speculative—impressions and feelings about other people, hearsay, gossip, and so on. Furthermore, the very analytical inputs—reports, documents, and hard data in general—seem to be of relatively little importance to many managers. (After a steady diet of soft information, one chief executive came across the first piece of hard data he had seen all week—an accounting report—and put it aside with the comment, "I never look at this.")

What can managers do with this soft, speculative information? They "synthesize" rather than "analyze" it, I should think. (How do you analyze the mood of a friend or the grimace someone makes in response to a suggestion?) A great deal of this information helps the manager understand implicitly his organization and its environment, to "see the big picture." This very expression, so common in management, implies a relational, holistic use of information. In effect, managers (like everyone else) use their information to build mental "models" of their world, which are implicit synthesized apprehensions of how their organizations and environments function. Then, whenever an action is contemplated, the manager can simulate the outcome using his implicit models.

There can be little doubt that this kind of activity goes on all the time in the world of management. A number of words managers commonly use suggest this kind of mental process. For example, the word "hunch" seems to refer to the thought that results from such an implicit simulation. "I don't know why, but I have a hunch that if we do x, then they will respond with y." Managers also use the word *judgment* to refer to thought processes that work but are unknown to them. *Judgment* seems to be the word that the verbal intellect has given to the thought processes that it cannot articulate. Maybe "he has good judgment" simply means "he has good right-hemispheric models."

3

Another consequence of the verbal nature of the manager's information is of interest here. The manager tends to be the best informed member of his organization, but he has difficulty disseminating his information to his employees. Therefore, when a manager overloaded with work finds a new task that needs doing, he faces a dilemma: he must either delegate the task without the background information or simply do the task himself, neither of which is satisfactory.

When I first encountered this dilemma of delegation, I described it in terms of time and of the nature of the manager's information; because so much of a manager's information is verbal (and stored in his head), the dissemination of it consumes much of his time. But now the split-brain research suggests that a second, perhaps more significant, reason for the dilemma of delegation exists. The manager may simply be incapable of disseminating some relevant information because it is removed from his verbal consciousness. (This suggests that we might need a kind of managerial psychoanalyst to coax it out of him!)

4

Earlier in this article I wrote that managers revel in ambiguity, in complex, mysterious systems without much order. Let us look at evidence of this. What I have discussed so far about the manager's use of information suggests that their work is geared to action, not reflection. We see further evidence for this in the pace of their work ("Breaks are rare. It's one damn thing after another"); the brevity of their activities (half of the chief executives' activities I observed were completed in less than 9 minutes); the variety of their activities (the chief executives had no evident patterns in their workdays); the fact that they [illegible] a preference for interruption in their work (stopping meetings, leaving their doors open); and the lack of routine in their work (only

7% of 368 verbal contacts I observed were regularly scheduled, only 1% dealt with a general issue that was in any way related to general planning).

Clearly, the manager does not operate in a systematic, orderly, and intellectual way, puffing his pipe up in a mountain retreat, as he analyzes his problems. Rather, he deals with issues in the context of daily activities—the cigarette in his mouth, one hand on the telephone, and the other shaking hands with a departing guest. The manager is involved, plugged in; his mode of operating is relational, simultaneous, experiential, that is, encompassing all the characteristics of the right hemisphere.

5

If the most important managerial roles of the ten described in the research were to be isolated, *leader*, *liaison*, and *disturbance handler* would certainly be among them. (The other seven are *figurehead*, *monitor*, *disseminator*, *spokesman*, *negotiator*, *entrepreneur*, and *resource allocator*, and the last two are also among the most important roles.) Yet these three are the roles least "known" about. *Leader* describes how the manager deals with his own employees. It is ironic that despite an immense amount of research, managers and researchers still know virtually nothing about the essence of leadership, about why some people follow and others lead. Leadership remains a mysterious chemistry; catchall words such as *charisma* proclaim our ignorance.

In the *liaison* role, the manager builds up a network of outside contacts, which serve as his or her personal information system. Again, the activities of this role remain almost completely outside the realm of articulated knowledge. And as a *disturbance handler* the manager handles problems and crises in his organization. Here again, despite an extensive literature on analytical decision making, virtually nothing is written about decision making under pressure. These activities remain outside the realm of management science, inside the realm of intuition and experience.

6

Let us turn now to strategic decision-making processes. There are 7 "routines" that seem to describe the steps involved in such decision making. These are *recognition*, *diagnosis*, *search*, *design*, *screening*, *evaluation/choice*, and *authorization*. Two of these routines stand out above the rest—the *diagnosis* of decision situations and the design of custom-made solutions—in that almost nothing is known of them. Yet these two stand out for another reason as well: they are probably the most important of the seven. In particular, diagnosis seems to be *the* crucial step in strategic decision making, for it is in that routine that the whole course of decision making is set.

It is a surprising fact, therefore, that diagnosis goes virtually without mention in the literature of planning or management science. (Almost all of the later literature deals with the formal evaluation of given alternatives, yet this is often a kind of trimming on the process, insignificant in terms of determining actual outcomes.) In the study of the decision processes themselves, the managers making the decisions, mentioned taking an explicit diagnostic step in only 14 of the 25 decision processes. But all the managers must have made some diagnosis; it is difficult to imagine a decision-making process with no diagnosis at all, no assessment of the situation. The question is, therefore, *where* did diagnosis take place?

7

Another point that emerges from studying strategic decision-making processes is the existence and profound influence of what can be called the *dynamic factors*. Strategic decision-making processes are stopped by interruptions, delayed and speeded up by timing factors, and forced repeatedly to branch and cycle. These processes are, therefore, dynamic ones of importance. Yet it is the dynamic factors that the ordered, sequential techniques of analysis are least able to handle. Thus, despite their importance, the dynamic factors go virtually without mention in the literature of management science.

Let's look at timing, for example. It is evident that timing is crucial in virtually everything the manager does. No manager takes action without considering the effect of moving more or less quickly, of seizing the initiative, or of delaying to avoid complications. Yet in one review of the literature of management, the authors found fewer than 10 books in 183 that refer directly to the subject of timing.[5] Essentially, managers are left on their own to deal with the dynamic factors, which involve simultaneous, relational modes of thinking.

8

When managers do have to make serious choices from among options, how do they in fact make them? Three fundamental modes of selection can be distinguished—analysis, judgment, and bargaining. The first involves the systematic evaluation of op-

5. Clyde T. Hardwick, and Bernard F. Landuyt, *Administrative Strategy and Decision Making*, 2nd ed. (Cincinnati: South Western, 1966).

tions in terms of their consequences on stated organizational goals; the second is a process in the mind of a single decision maker; and the third involves negotiations between different decision makers.

One of the most surprising facts about how managers made the 25 strategic decisions studied is that so few reported using explicit analysis; only in 18 out of 83 choices made did managers mention using it. There was considerable bargaining, but in general the selection mode most commonly used was judgment. Typically, the options and all kinds of data associated with them were pumped into the mind of a manager, and somehow a choice later came out. *How* was never explained. *How* is never explained in any of the literature either. Yehezkel Dror, a leading figure in the study of public policy making, is one of the few thinkers to face the issue squarely. He writes:

"Experienced policy makers, who usually explain their own decisions largely in terms of subconscious processes such as 'intuition' and 'judgment', unanimously agree, and even emphasize, that extrarational processes play a positive and essential role in policymaking. Observations of policymaking behavior in both small and large systems, indeed, all available description of decisional behavior, especially that of leaders such as Bismarck, Churchill, DeGaulle, and Kennedy, seem to confirm that policy makers' opinion." [6]

9

Finally, in the area of strategy formulation, I can offer only a "feel" for the results since my research is still in progress. However, some ideas have emerged. Strategy formulation does not turn out to be the regular, continuous, systematic process depicted in so much of the planning literature. It is most often an irregular, discontinuous process, proceeding in fits and starts. There are periods of stability in strategy development, but also there are periods of flux, of groping, of piecemeal change, and of global change. To my mind, a "strategy" represents the mediating force between a dynamic environment and a stable operating system. Strategy is the organization's "conception" of how to deal with its environment for a while.

Now, the environment does not change in any set pattern. For example, the environment does not run on planners' forecast schedules. It can be stable for thirteen years, and then suddenly blow all to hell in the fourteenth. And even if change were steady, the human brain does not generally perceive it that way. People tend to underreact to mild stimuli and overreact to strong ones. It stands to reason, therefore, that strategies that mediate between environments and organizational operations do not change in regular patterns, but rather, as I observed earlier, in fits and starts.

How does strategic planning account for fits and starts? The fact is that it does not (as planners were made so painfully aware of during the energy crisis). So again, the burden to cope falls on the manager, specifically on his mental processes—intuitional and experiential—that can deal with the irregular inputs from the environment.

10

Let me probe more deeply into the concept of strategy. Consider the organization that has no strategy, no way to deal consistently with its environment; it simply reacts to each new pressure as it comes along. This is typical behavior for an organization in a very difficult situation, where the old strategy has broken down beyond repair, but where no new strategy has yet emerged. Now, if the organization wishes to formulate a new strategy, how does it do so (assuming that the environment has stabilized sufficiently to allow a new strategy to be formulated)?

Let me suggest two ways (based on still tentative results). If the organization goes the route of systematic planning, I suggest that it will probably come up with what can be called a "main-line" strategy. In effect, it will do what is generally expected of organizations in its situation; where possible, for example, it will copy the established strategies of other organizations. If it is in the automobile business, for instance, it might use the basic General Motors strategy, as Chrysler and Ford have so repeatedly done.

Alternatively, if the organization wishes to have a creative, integrated strategy which can be called a "gestalt strategy," such as Volkswagen's one in the 1950s, then I suggest the organization will rely largely on one individual to conceptualize its strategy, to synthesize a "vision" of how the organization will respond to its environment. In other words, scratch an interesting strategy, and you will probably find a single strategy formulator beneath it. Creative, in-

6. Yehezkel Dror, *Public Policymaking Re-Examined* (Scranton: Chandler, 1968), p. 149.

7. Ornstein, p. 10.

tegrated strategies seem to be the products of single brains, perhaps of single right hemispheres.

A strategy can be made explicit, can be announced as what the organization intends to do in the future, only when the vision is fully worked out, if it ever is. Often, of course, it is never felt to be fully worked out, hence the strategy is never made explicit and remains the private vision of the chief executive. (Of course, in some situations the formulator need not be the manager. There is no reason why a manager cannot have a creative right-hand man—really a left-hand man—who works out his gestalt strategy for him, and then articulates it to him.) No management process is more demanding of holistic, relational, gestalt thinking than the formulation of a creative, integrated strategy to deal with a complex, intertwined environment.

How can sequential analysis (under the label *strategic planning*) possibly lead to a gestalt strategy?

Another "famous old story" has relevance here. It is the one about the blind men trying to identify an elephant by touch. One grabs the trunk and says the elephant is long and soft; another holds the leg and says it is massive and cylindrical; a third touches the skin and says it is rough and scaly. What the story points out is that—

"Each person standing at one part of the elephant can make his own limited, analytic assessment of the situation, but we do not obtain an elephant by adding "scaly," "long and soft," "massive and cylindrical" together in any conceivable proportion. Without the development of an overall perspective, we remain lost in our individual investigations. Such a perspective is a province of another mode of knowledge, and cannot be achieved in the same way that individual parts are explored. It does not arise out of a linear sum of independent observations." [7]

What can we conclude from these ten findings? I must first reemphasize that everything I write about the two hemispheres of the brain falls into the realm of speculation. Researchers have yet to formally relate any management process to the functioning of the human brain. Nevertheless, the ten points do seem to support the hypothesis stated earlier: *the important policy-level processes required to manage an organization rely to a considerable extent on the faculties identified with the right hemisphere.*

This conclusion does not imply that the left hemisphere is unimportant for policy makers. I have overstated my case here to emphasize the importance of the right. The faculties identified with the left hemisphere are obviously important as well for effective management. Every manager engages in considerable explicit calculation when he or she acts, and all intuitive thinking must be translated into the linear order of the left if it is to be articulated and eventually put to use. The great powers that appear to be associated with the right hemisphere are obviously useless without the faculties of the left. The artist can create without verbalizing; the manager cannot.

Truly outstanding managers are no doubt the ones who can couple effective right-hemispheric processes (hunch, judgment, synthesis, and so on) with effective processes of the left (articulateness, logic, analysis, and so on). But there will be little headway in the field of management if managers and researchers continue to search for the key to managing in the lightness of ordered analysis. Too much will stay unexplained in the darkness of intuition.

Before I go on to discuss the implications for management science and planning, I want to stress again that throughout this article I have been focusing on processes that managers employ at the policy level of the organization. It seems that the faculties identified with the right-hemispheric activities are most important in the higher levels of an organization, at least in those with "top-down" policy-making systems.

In a sense, the coupling of the holistic and the sequential reflects how bureaucratic organizations themselves work. The policy maker conceives the strategy in holistic terms, and the rest of the hierarchy—the functional departments, branches, and shops—implement it in sequence. Whereas the right-hemispheric faculties may be more important at the top of an organization, the left-hemispheric ones may dominate lower down.

Implications for the left hemisphere

Let me offer a final word. What does all I've discussed mean for those associated with management?

For planners and management scientists

No, I do not suggest that planners and management scientists pack up their bags of techniques and leave the field of management, or that they take up basket-weaving or meditation in their spare time. (I haven't —at least not yet!) It seems to me that the left hemisphere is alive and well; the analytic community is firmly established, and indispensable, at the operating and middle levels of most organizations. Its real problems occur at the policy level. Here analysis must co-exist with—perhaps even take its lead from—intuition, a fact that many analysts and planners have been slow to accept. To my mind, organizational effectiveness does not lie in that narrow-minded concept called "rationality"; it lies in a blend of clear-headed logic *and* powerful intuition. Let me illustrate this with two points.

□
First, only under special circumstances should planners try to plan. When an organization is in a stable environment and has no use for a very creative strategy—the telephone industry may be the best example—then the development of formal, systematic strategic plans (and main-line strategies) may be in order. But when the environment is unstable or the organization needs a creative strategy, then strategic planning may not be the best approach to strategy formulation, and planners have no business pushing the organization to use it.

□
Second, effective decision making at the policy level requires good analytical input; it is the job of the planner and management scientist to ensure that top management gets it. Managers are very effective at securing soft information, but they tend to underemphasize analytical input that is often important as well. The planners and management scientists can serve their organizations effectively by carrying out ad hoc analyses and feeding the results to top management (need I say verbally?), ensuring that the very best of analysis is brought to bear on policy making. But at the same time, planners need to recognize that these inputs cannot be the only ones used in policy making, that soft information is crucial as well.

For the teacher of managers

If the suggestions in this article turn out to be valid, then educators had better revise drastically some of their notions about management education, because the revolution in that sphere over the last fifteen years—while it has brought so much of use—has virtually consecrated the modern management school to the worship of the left hemisphere.

Should educators be surprised that so many of their graduates end up in staff positions, with no intention of ever managing anything? Some of the best-known management schools have become virtual closed systems in which professors with little interest in the reality of organizational life teach inexperienced students the theories of mathematics, economics, and psychology as ends in themselves. In these management schools, management is accorded little place.

I am not preaching a return to the management school of the 1950s. That age of fuzzy thinking has passed, thankfully. Rather, I am calling for a new balance in our schools, the balance that the best of human brains can achieve, between the analytic and the intuitive. In particular, greater use should be made of the powerful new skill-development techniques which are experiential and creative in nature, such as role playing, the use of video-tape, behavior laboratories, and so on. Educators need to put students into situations, whether in the field or in the simulated experience of the laboratory, where they can practice managerial skills, not only interpersonal but also informational and decisional. Then specialists would follow up with feedback on the students' behavior and performance.

For managers

The first conclusion for managers should be a call for caution. The findings of the cognitive psychologists should not be taken as license to shroud activities in darkness. The mystification of conscious behavior is a favorite ploy of those seeking to protect a power base (or to hide their intentions of creating one); this behavior helps no organization, and neither does forcing to the realm of intuition activities that can be handled effectively by analysis.

A major thrust of development in our organizations, ever since Frederick Taylor began experimenting in factories late in the last century, has been to shift activities out of the realm of intuition, toward conscious analysis. That trend will continue. But managers, and those who work with them, need to be careful to distinguish that which is best handled analytically from that which must remain in the realm of intuition, where, in the meantime, we should be looking for the lost keys to management.

27 SEP 1978

Executive Registry
74-3555

MEMORANDUM FOR: Mr. Knoche

HANK

I think this will appeal to your interest in the literature of management. Sorry that my copy has a bit of the right margin missing on a couple of pages, but I think it can be tracked.

25X1

[redacted]

RH
Totally fascinating! Pls have someone fill in the right-hand margins and prepare copies for EAG members. Before sending out the copies I want to cover them with a note. Also, I need to call to thank him.

25X1

[redacted]

25X1

FORM 5-73 101 USE PREVIOUS EDITIONS

Planning on the left side and managing on the right

Henry Mintzberg

Which hemisphere of one's brain is better developed may determine whether a person ough to be a planner or a manager

Did you ever wonder why some things come so easily and others seem so difficult, why sometimes you just cannot get your brain to work? Maybe the problem is not that you are stupid or tired, but that you are tackling a problem that taxes the least developed hemisphere of your brain. Recent scientific research shows that the human brain is specialized, the logical, linear functions occurring in the left hemisphere, and the holistic, relational ones occurring in the right. The author of this article maintains that this finding has great implications for both the science and art of management. For instance, in an organization, the author suggests that the top managers should have well developed right-hemispheric processes, and the planners well developed left-hemispheric processes. Perhaps the most important conclusion he arrives at is that the functions and capacities of the two hemispheres should both be respected, but that one should not be confused or applied where the other is better suited.

Mr. Mintzberg is a professor in the Faculty of Management at McGill University, Montreal, Canada. He is currently visiting professor at Centre d'Etude et de Recherche sur les Organisations et la Gestion (I.A.E.) in Aix-en-Provence, France. He has written extensively on the manager and his work, and is the author of HBR's McKinsey Award-winning article for 1975, "The Manager's Job: Folklore and Fact," which appeared in the July-August issue.

In the folklore of the Middle East, the story is to about a man named Nasrudin, who was searchi for something on the ground. A friend came by a asked: "What have you lost, Nasrudin?"

"My key," said Nasrudin.

So, the friend went down on his knees, too, and th both looked for it. After a time, the friend aske "Where exactly did you drop it?"

"In my house," answered Nasrudin.

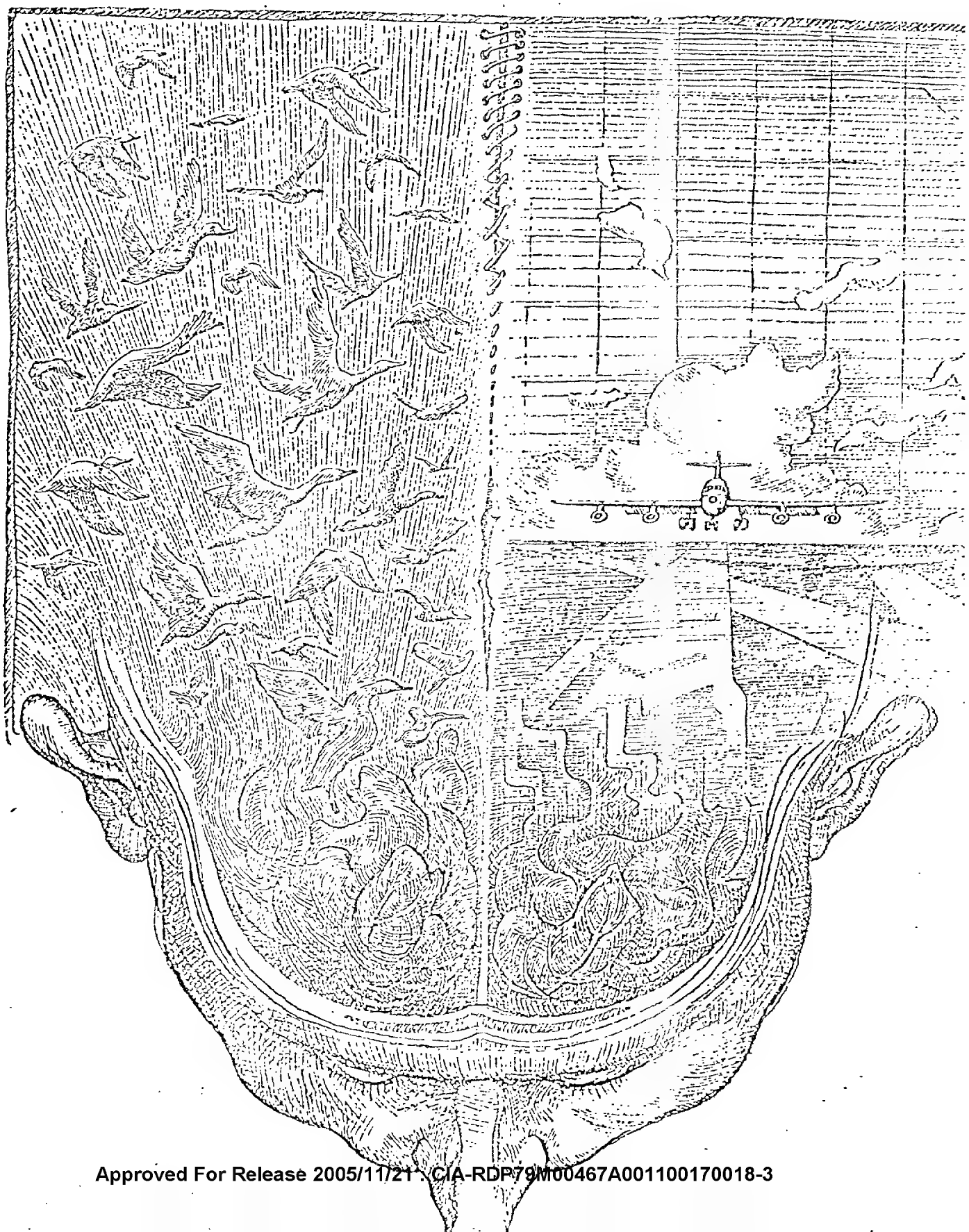
"Then why are you looking here, Nasrudin?"

"There is more light here than inside my ow house."

This "light" little story is old and worn, yet it h some timeless, mysterious appeal, one which h much to do with the article that follows. But let m leave the story momentarily while I pose some que tions—also simple yet mysterious—that have alwa puzzled me.

□

First: Why are some people so smart and so dull the same time, so capable of mastering certai mental activities and so incapable of masteri others? Why is it that some of the most creativ thinkers cannot comprehend a balance sheet, a that some accountants have no sense of product d



sign? Why do some brilliant management scientists have no ability to handle organizational politics, while some of the most politically adept individuals cannot seem to understand the simplest elements of management science?

□

Second: Why do people sometimes express such surprise when they read or learn the obvious, something they already must have known? Why is a manager so delighted, for example, when he reads a new article on decision making, every part of which must be patently obvious to him even though he has never before seen it in print?

□

Third: Why is there such a discrepancy in organizations, at least at the policy level, between the science and planning of management on the one hand, and managing on the other? Why have none of the techniques of planning and analysis really had much effect on how top managers function?

What I plan to do in this article is weave together some tentative answers to these three questions with the story of Nasrudin around a central theme, namely, that of the specialization of the hemispheres of the human brain and what that specialization means for management.

The two hemispheres of the human brain

Let us first try to answer the three questions by looking at what is known about the hemispheres of the brain.

Question one

Scientists—in particular, neurologists, neurosurgeons, and psychologists—have known for a long time that the brain has two distinct hemispheres. They have known, further, that the left hemisphere controls movements on the body's right side and that the right hemisphere controls movements on the left. What they have discovered more recently, however, is that these two hemispheres are specialized in more fundamental ways.

In the left hemisphere of most peopl...

cesses are found. It seems that the mode of operation of the brain's left hemisphere is linear; it processes information sequentially, one bit after anothe in an ordered way. Perhaps the most obvious linea faculty is language. In sharp contrast, the right hem sphere is specialized for simultaneous processin; that is, it operates in a more holistic, relational wa: Perhaps its most obvious faculty is comprehensio of visual images.

Although relatively few specific mental activiti have yet been associated with one hemisphere or th other, research is proceeding very quickly. For ex ample, a recent article in *The New York Tim* cites research which suggests that emotion may be right-hemispheric function.[1] This notion is based c the finding that victims of right-hemispheric strok are often comparatively untroubled about their i: capacity, while those with strokes of the left hem sphere often suffer profound mental anguish.

What does this specialization of the brain mean f the way people function? Speech, being linear, a left-hemispheric activity, but other forms of hum communication, such as gesturing, are relation rather than sequential and tend to be associat with the right hemisphere. Imagine what wou happen if the two sides of a human brain we detached so that, for example, in reacting to a stir ulus, a person's words would be separate from h gestures. In other words, the person would ha two separate brains—one specialized for verbal com munication, and the other for gestures—that wou react to the same stimulus.

This "imagining," in fact, describes how the ma breakthrough in the recent research on the hum brain took place. In trying to treat certain cases epilepsy, neurosurgeons found that by severing t corpus callosum, which joins the two hemispher of the brain, they could "split the brain," isolati the epilepsy. A number of experiments run on the "split-brain" patients produced some fascinati results.

In one experiment doctors showed a woman epile tic's right hemisphere a photograph of a nude wo an. (This is done by showing it to the left half each eye.) The patient said she saw nothing, but most simultaneously blushed and seemed confu "conscious" left hem sphere, including her verbal apparatus, was aw only that something had happened to her body, b

not of what had caused the emotional turmoil. Only her "unconscious" right hemisphere knew. Here neurosurgeons observed a clear split between the two independent consciousnesses that are normally in communication and collaboration.[2]

Now, scientists have further found that some common human tasks activate one side of the brain while leaving the other largely at rest. For example, a person's learning a mathematical proof might evoke activity in the left hemisphere of his brain, while his conceiving a piece of sculpture or assessing a political opponent might evoke activity in his right.

So now we seem to have the answer to the first question. An individual can be smart and dull at the same time simply because one side of his or her brain is more developed than the other. Some people—probably most lawyers, accountants, and planners—have better developed left-hemispheric thinking processes, while others—artists, sculptors, and perhaps politicians—have better developed right-hemispheric processes. Thus an artist may be incapable of expressing his feelings in words, while a lawyer may have no facility for painting. Or a politician may not be able to learn mathematics, while a management scientist may constantly be manipulated in political situations.

Eye movement is apparently a convenient indicator of hemispheric development. When asked to count the letters in a complex word such as *Mississippi* in their heads, most people will gaze off to the side opposite their most developed hemisphere. (Be careful of lefties, however.) But if the question is a specialized one—for example, if it is emotionally laden, spatial, or purely mathematical—the number of people gazing one way or another will change substantially.

Question two

A number of word opposites have been proposed to distinguish the two hemispheric modes of "consciousness," for example: explicit versus implicit; verbal versus spatial; argument versus experience; intellectual versus intuitive; and analytic versus gestalt.

I should interject at this point that these words, as well as much of the evidence for these conclusions, can be found in the remarkable book entitled *The Psychology of Consciousness* by Robert Ornstein, a research psychologist in California. Ornstein uses the story of Nasrudin to further the point he is making. Specifically, he refers to the linear hemisphere as synonymous with lightness, with thought processes that we know in an explicit sense. We can *articulate* them. He associates the right hemisphere with darkness, with thought processes that are mysterious to us, at least "us" in the Western world.

Ornstein also points out how the "esoteric psychologies" of the East (Zen, Yoga, Sufism, and so on) have focused on right-hemispheric consciousness (for example, altering pulse rate through meditation). In sharp contrast, Western psychology has been concerned almost exclusively with left-hemispheric consciousness, with logical thought. Ornstein suggests that we might find an important key to human consciousness in the right hemisphere, in what to us in the West is the darkness. To quote him:

"Since these experiences [transcendence of time, control of the nervous system, paranormal communication, and so on] are, by their very mode of operation, not readily accessible to causal explanation or even to linguistic exploration, many have been tempted to ignore them or even to deny their existence. These traditional psychologies have been relegated to the 'esoteric' or the 'occult,' the realm of the mysterious—the word most often employed is 'mysticism.' It is a taboo area of inquiry, which has been symbolized by the Dark, the Left side [the right hemisphere] of ourselves, the Night."[3]

Now, reflect on this for a moment. (Should I stop meditate?) There is a set of thought processes—linear, sequential, analytical—that scientists as well as the rest of us know a lot about. And there is another set—simultaneous, relational, holistic—that we know little about. More importantly, here we do not "know" what we "know" or, more exactly, our left hemispheres cannot articulate explicitly what our right hemispheres know implicitly.

2. Robert Ornstein, *The Psychology of Consciousness* (San Francisco: W.H. Freeman, 1975), p. 60.

3. Ibid., p. 97.

4. These findings are based on (a) my observational study of the work of five chief executives reported in *The Nature of Managerial Work* (New York: Harper and Row, 1973) and in "The Manager's Job: Folklore and Fact" (HBR July-August 1975, p. 49); (b) a study of twenty-five strategic decision processes reported in "The Structure of 'Unstructured' Decision Processes," coauthored with Duru Raisinghani and André Théorêt, to appear in a forthcoming issue of *Administrative Science Quarterly*; and (c) a series of studies carried out under my supervision at McGill University on the formation of organizational strategies over periods of decades, reported in "Patterns in Strategy Formation," Working Paper, I.A.E., Aix-en-Provence, France, forthcoming in *Management Science*.

So here is, seemingly, the answer to the second question as well. The feeling of revelation about learning the obvious can be explained with the suggestion that the "obvious" knowledge was implicit, apparently restricted to the right hemisphere. The left hemisphere never "knew." Thus it seems to be a revelation to the left hemisphere when it learns explicitly what the right hemisphere knew all along implicitly.

Now only the third question—the discrepancy between planning and managing—remains.

Question three

By now, it should be obvious where my discussion is leading (obvious, at least, to the reader's right hemisphere and, now that I write it, to the reader's left hemisphere as well). It may be that management researchers have been looking for the key to management in the lightness of logical analysis whereas perhaps it has always been lost in the darkness of intuition.

Specifically, I propose that there may be a fundamental difference between formal planning and informal managing, a difference akin to that between the two hemispheres of the human brain. The techniques of planning and management science are sequential and systematic; above all, articulated. Planners and management scientists are expected to proceed in their work through a series of logical, ordered steps, each one involving explicit analysis. (The argument that the successful application of these techniques requires considerable intuition does not really change my point. The occurrence of intuition simply means that the analyst is departing from his science, as it is articulated, and is behaving more like a manager.)

Formal planning, then, seems to use processes akin to those identified with the brain's left hemisphere. Furthermore, planners and management scientists seem to revel in a systematic, well-ordered world, and many show little appreciation for the more relational, holistic processes.

What about managing? More exactly, what about the processes used by top managers? (Let me emphasize here that I am focusing this discussion at the policy level of organizations, where I believe the dichotomy between planning and managing is most sharp.) Managers plan in some ways, too, (that is, they think ahead) and they engage in their share of logical analysis. But I believe there is more than that to the effective managing of an organization. I hypothesize, therefore, that *the important policy processes of managing an organization rely to a considerable extent on the faculties identified with the brain's right hemisphere.* Effective managers seem to revel in ambiguity; in complex, mysterious systems with relatively little order.

If true, this hypothesis would answer the third question about the discrepancy between planning and managing. It would help to explain why each of the new analytic techniques of planning and analysis has, one after the other, had so little success at the policy level. PPBS, strategic planning, "management" (or "total") information systems, and models of the company—all have been greeted with great enthusiasm; then, in many instances, a few years later have been quietly ushered out the corporate back door. Apparently none served the needs of decision making at the policy level in organizations; at that level other processes may function better.

Managing from the right hemisphere

Because research has so far told us little about the right hemisphere, I cannot support with evidence my claim that a key to managing lies there. I can only present to the reader a "feel" for the situation, not a reading of concrete data. A number of findings from my own research on policy-level processes do, however, suggest that they possess characteristics of right-hemispheric thinking.[4]

One fact recurs repeatedly in all of this research: the key managerial processes are enormously complex and mysterious (to me as a researcher, as well as to the managers who carry them out), drawing on the vaguest of information and using the least articulated of mental processes. These processes seem to be more relational and holistic than ordered and sequential, and more intuitive than intellectual; they seem to be most characteristic of right-hemispheric activity.

Here are ten general findings:

The five chief executives I observed strongly favored the verbal media of communication, especially meet

ings, over the written forms, namely reading and writing. (The same result has been found in virtually every study of managers, no matter what their level in the organization or the function they supervised.) Of course verbal communication is linear, too, but it is more than that. Managers seem to favor it for two fundamental reasons that suggest a relational mode of operation.

First, verbal communication enables the manager to "read" facial expressions, tones of voice, and gestures. As I mentioned earlier, these stimuli seem to be processed in the right hemisphere of the brain. Second, and perhaps more important, verbal communication enables the manager to engage in the "real-time" exchange of information. Managers' concentration on the verbal media, therefore, suggests that they desire relational, simultaneous methods of acquiring information, rather than the ordered and sequential ones.

2

In addition to noting the media managers use, it is interesting to look at the content of managers' information, and at what they do with it. The evidence here is that a great deal of the manager's inputs are soft and speculative—impressions and feelings about other people, hearsay, gossip, and so on. Furthermore, the very analytical inputs—reports, documents, and hard data in general—seem to be of relatively little importance to many managers. (After a steady diet of soft information, one chief executive came across the first piece of hard data he had seen all week—an accounting report—and put it aside with the comment, "I never look at this.")

What can managers do with this soft, speculative information? They "synthesize" rather than "analyze" it, I should think. (How do you analyze the mood of a friend or the grimace someone makes in response to a suggestion?) A great deal of this information helps the manager understand implicitly his organization and its environment, to "see the big picture." This very expression, so common in management, implies a relational, holistic use of information. In effect, managers (like everyone else) use their information to build mental "models" of their world, which are implicit synthesized apprehensions of how their organizations and environments function. Then, whenever an action is contemplated, the manager can simulate the outcome using his implicit models.

There can be little doubt that this kind of activity goes on all the time in the world of management.

A number of words managers commonly use suggest this kind of mental process. For example, the word "hunch" seems to refer to the thought that results from such an implicit simulation. "I don't know why, but I have a hunch that if we do x then they will respond with y." Managers also use the word *judgment* to refer to thought processes that work but are unknown to them. *Judgment* seems to be the word that the verbal intellect has given to the thought processes that it cannot articulate. Maybe "he has good judgment" simply means "he has good right-hemispheric models."

3

Another consequence of the verbal nature of the manager's information is of interest here. The manager tends to be the best informed member of his organization, but he has difficulty disseminating his information to his employees. Therefore, when a manager overloaded with work finds a new task that needs doing, he faces a dilemma: he must either delegate the task without the background information or simply do the task himself, neither of which is satisfactory.

When I first encountered this dilemma of delegation, I described it in terms of time and of the nature of the manager's information; because so much of a manager's information is verbal (and stored in his head), the dissemination of it consumes much of his time. But now the split-brain research suggests that a second, perhaps more significant, reason for the dilemma of delegation exists. The manager may simply be incapable of disseminating some relevant information because it is removed from his verbal consciousness. (This suggests that we might need a kind of managerial psychoanalyst to coax it out of him!)

4

Earlier in this article I wrote that managers revel in ambiguity, in complex, mysterious systems without much order. Let us look at evidence of this. What I have discussed so far about the manager's use of information suggests that their work is geared to action, not reflection. We see further evidence for this in the pace of their work ("Breaks are rare. It's one damn thing after another"); the brevity of their activities (half of the chief executives' activities I observed were completed in less than 9 minutes); the variety of their activities (the chief executives had no evident patterns in their workdays); the fact that they actively exhibit a preference for interruption in their work (stopping meetings, leaving their doors open); and the lack of routine in their workdays).

7% of 368 verbal contacts I observed were regularly scheduled, only 1% dealt with a general issue that was in any way related to general planning).

Clearly, the manager does not operate in a systematic, orderly, and intellectual way, puffing his pipe up in a mountain retreat, as he analyzes his problems. Rather, he deals with issues in the context of daily activities—the cigarette in his mouth, one hand on the telephone, and the other shaking hands with a departing guest. The manager is involved, plugged in; his mode of operating is relational, simultaneous, experiential, that is, encompassing all the characteristics of the right hemisphere.

5

Of the most important managerial roles of the ten described in the research were to be isolated, *leader*, *liaison*, and *disturbance handler* would certainly be among them. (The other seven are *figurehead*, *monitor*, *disseminator*, *spokesman*, *negotiator*, *entrepreneur*, and *resource allocator*, and the last two are also among the most important roles.) Yet these three are the roles least "known" about. *Leader* describes how the manager deals with his own employees. It is ironic that despite an immense amount of research, managers and researchers still know virtually nothing about the essence of leadership, about why some people follow and others lead. Leadership remains a mysterious chemistry; catchall words such as *charisma* proclaim our ignorance.

In the *liaison* role, the manager builds up a network of outside contacts, which serve as his or her personal information system. Again, the activities of this role remain almost completely outside the realm of articulated knowledge. And as a *disturbance handler* the manager handles problems and crises in his organization. Here again, despite an extensive literature on analytical decision making, virtually nothing is written about decision making under pressure. These activities remain outside the realm of management science, inside the realm of intuition and experience.

6

Let us turn now to strategic decision-making processes. There are 7 "routines" that seem to describe the steps involved in such decision making. These are *recognition*, *diagnosis*, *search*, *design*, *screening*, *evaluation/choice*, and *authorization*. Two of these routines stand out above the rest—the *diagnosis* of decision situations and the *design* of custom-made solutions—in that almost nothing is known of them. Yet these two stand out for another reason as well: they are probably the most important of the seven. In particular, diagnosis seems to be the crucial step in strategic decision making, for it is in that routine that the whole course of decision making is set.

It is a surprising fact, therefore, that diagnosis goes virtually without mention in the literature of planning or management science. (Almost all of the later literature deals with the formal evaluation of given alternatives, yet this is often a kind of trimming on the process, insignificant in terms of determining actual outcomes.) In the study of the decision processes themselves, the managers making the decisions, mentioned taking an explicit diagnostic step in only 14 of the 25 decision processes. But all the managers must have made some diagnosis; it is difficult to imagine a decision-making process with no diagnosis at all, no assessment of the situation. The question is, therefore, *where* did diagnosis take place?

7

Another point that emerges from studying strategic decision-making processes is the existence and profound influence of what can be called the *dynamic factors*. Strategic decision-making processes are stopped by interruptions, delayed and speeded up by timing factors, and forced repeatedly to branch and cycle. These processes are, therefore, dynamic ones of importance. Yet it is the dynamic factors that the ordered, sequential techniques of analysis are least able to handle. Thus, despite their importance, the dynamic factors go virtually without mention in the literature of management science.

Let's look at timing, for example. It is evident that timing is crucial in virtually everything the manager does. No manager takes action without considering the effect of moving more or less quickly, of seizing the initiative, or of delaying to avoid complications. Yet in one review of the literature of management, the authors found fewer than 10 books in 183 that refer directly to the subject of timing.[5] Essentially, managers are left on their own to deal with the dynamic factors, which involve simultaneous, relational modes of thinking.

8

When managers do have to make serious choices from among options, how do they in fact make them? Three fundamental modes of selection can be distinguished: analysis, judgment, and bargaining. The first involves the systematic evaluation of op-

5. Clyde T. Hardwick, and [illegible], *Administrative Strategy and Decision Making*, 2nd ed. (Cincinnati: South Western, 1966).

tions in terms of their consequences on stated organizational goals; the second is a process in the mind of a single decision maker; and the third involves negotiations between different decision makers.

One of the most surprising facts about how managers made the 25 strategic decisions studied is that so few reported using explicit analysis; only in 18 out of 83 choices made did managers mention using it. There was considerable bargaining, but in general the selection mode most commonly used was judgment. Typically, the options and all kinds of data associated with them were pumped into the mind of a manager, and somehow a choice later came out. *How* was never explained. *How* is never explained in any of the literature either. Yehezkel Dror, a leading figure in the study of public policy making, is one of the few thinkers to face the issue squarely. He writes:

"Experienced policy makers, who usually explain their own decisions largely in terms of subconscious processes such as 'intuition' and 'judgment', unanimously agree, and even emphasize, that extrarational processes play a positive and essential role in policymaking. Observations of policymaking behavior in both small and large systems, indeed, all available description of decisional behavior, especially that of leaders such as Bismarck, Churchill, DeGaulle, and Kennedy, seem to confirm that policy makers' opinion." [6]

9

Finally, in the area of strategy formulation, I can offer only a "feel" for the results since my research is still in progress. However, some ideas have emerged. Strategy formulation does not turn out to be the regular, continuous, systematic process depicted in so much of the planning literature. It is most often an irregular, discontinuous process, proceeding in fits and starts. There are periods of stability in strategy development, but also there are periods of flux, of groping, of piecemeal change, and of global change. To my mind, a "strategy" represents the mediating force between a dynamic environment and a stable operating system. Strategy is the organization's "conception" of how to deal with its environment for a while.

Now, the environment does not change in any set pattern. For example, the environment does not run on planners' five-year schedules; it may be stable for thirteen years and then suddenly blow all to hell in the fourteenth. And even if change were steady, the human brain does not generally perce it that way. People tend to underreact to mild stim and overreact to strong ones. It stands to reas therefore, that strategies that mediate between vironments and organizational operations do n change in regular patterns, but rather, as I observ earlier, in fits and starts.

How does strategic planning account for fits a starts? The fact is that it does not (as planners we made so painfully aware of during the energy crisi So again, the burden to cope falls on the manag specifically on his mental processes—intuitional a experiential—that can deal with the irregular inpu from the environment.

10

Let me probe more deeply into the concept of str egy. Consider the organization that has no str egy, no way to deal consistently with its enviro ment; it simply reacts to each new pressure as comes along. This is typical behavior for an orga ization in a very difficult situation, where the o strategy has broken down beyond repair, but whe no new strategy has yet emerged. Now, if the o ganization wishes to formulate a new strategy, ho does it do so (assuming that the environment h stabilized sufficiently to allow a new strategy to formulated)?

Let me suggest two ways (based on still tentati results). If the organization goes the route of sy tematic planning, I suggest that it will probab come up with what can be called a "main-lin strategy. In effect, it will do what is generally e pected of organizations in its situation; where po sible, for example, it will copy the established stra egies of other organizations. If it is in the automobi business, for instance, it might use the basic Gener Motors strategy, as Chrysler and Ford have so r peatedly done.

Alternatively, if the organization wishes to have creative, integrated strategy which can be called "gestalt strategy," such as Volkswagen's one in th 1950s, then I suggest the organization will rely larg ly on one individual to conceptualize its strategy, synthesize a "vision" of how the organization wi respond to its environment. In other words, scrat an interesting strategy, and you will probably find single strategy formulator beneath it. Creative, i

1968], p. 149.

7: Ornstein, p. 10.

tegrated strategies seem to be the products of single brains, perhaps of single right hemispheres.

A strategy can be made explicit, can be announced as what the organization intends to do in the future, only when the vision is fully worked out, if it ever is. Often, of course, it is never felt to be fully worked out, hence the strategy is never made explicit and remains the private vision of the chief executive. (Of course, in some situations the formulator need not be the manager. There is no reason why a manager cannot have a creative right-hand man—really a left-hand man—who works out his gestalt strategy for him, and then articulates it to him.) No management process is more demanding of holistic, relational, gestalt thinking than the formulation of a creative, integrated strategy to deal with a complex, intertwined environment.

How can sequential analysis (under the label *strategic planning*) possibly lead to a gestalt strategy?

Another "famous old story" has relevance here. It is the one about the blind men trying to identify an elephant by touch. One grabs the trunk and says the elephant is long and soft; another holds the leg and says it is massive and cylindrical; a third touches the skin and says it is rough and scaly. What the story points out is that—

"Each person standing at one part of the elephant can make his own limited, analytic assessment of the situation, but we do not obtain an elephant by adding "scaly," "long and soft," "massive and cylindrical" together in any conceivable proportion. Without the development of an overall perspective, we remain lost in our individual investigations. Such a perspective is a province of another mode of knowledge, and cannot be achieved in the same way that individual parts are explored. It does not arise out of a linear sum of independent observations." [7]

What can we conclude from these ten findings? I must first reemphasize that everything I write about the two hemispheres of the brain falls into the realm of speculation. Researchers have yet to formally relate any management process to the functioning of the human brain. Nevertheless, the ten points do seem to support the hypothesis stated earlier: *the important policy-level processes required to manage an organization rely to a considerable extent on the faculties identified with the brain's right hemisphere.*

This conclusion does not imply that the left hemisphere is unimportant for policy makers. I have overstated my case here to emphasize the importance of the right. The faculties identified with the left hemisphere are obviously important as well for effective management. Every manager engages in considerable explicit calculation when he or she acts, and all intuitive thinking must be translated into the linear order of the left if it is to be articulated and eventually put to use. The great powers that appear to be associated with the right hemisphere are obviously useless without the faculties of the left. The artist can create without verbalizing; the manager cannot.

Truly outstanding managers are no doubt the ones who can couple effective right-hemispheric processes (hunch, judgment, synthesis, and so on) with effective processes of the left (articulateness, logic, analysis, and so on). But there will be little headway in the field of management if managers and researchers continue to search for the key to managing in the lightness of ordered analysis. Too much will stay unexplained in the darkness of intuition.

Before I go on to discuss the implications for management science and planning, I want to stress again that throughout this article I have been focusing on processes that managers employ at the policy level of the organization. It seems that the faculties identified with the right-hemispheric activities are most important in the higher levels of an organization, at least in those with "top-down" policy-making systems.

In a sense, the coupling of the holistic and the sequential reflects how bureaucratic organizations themselves work. The policy maker conceives the strategy in holistic terms, and the rest of the hierarchy—the functional departments, branches, and shops—implement it in sequence. Whereas the right-hemispheric faculties may be more important at the top of an organization, the left-hemispheric ones may dominate lower down.

Implications for the left hemisphere

Let us return to practical reality for a final word. What do these findings imply for those associated with management?

For planners and management scientists

No, I do not suggest that planners and management scientists pack up their bags of techniques and leave the field of management, or that they take up basket-weaving or meditation in their spare time. (I haven't —at least not yet!) It seems to me that the left hemisphere is alive and well; the analytic community is firmly established, and indispensable, at the operating and middle levels of most organizations. Its real problems occur at the policy level. Here analysis must co-exist with—perhaps even take its lead from—intuition, a fact that many analysts and planners have been slow to accept. To my mind, organizational effectiveness does not lie in that narrow-minded concept called "rationality"; it lies in a blend of clear-headed logic *and* powerful intuition. Let me illustrate this with two points.

□

First, only under special circumstances should planners try to plan. When an organization is in a stable environment and has no use for a very creative strategy—the telephone industry may be the best example—then the development of formal, systematic strategic plans (and main-line strategies) may be in order. But when the environment is unstable or the organization needs a creative strategy, then strategic planning may not be the best approach to strategy formulation, and planners have no business pushing the organization to use it.

□

Second, effective decision making at the policy level requires good analytical input; it is the job of the planner and management scientist to ensure that top management gets it. Managers are very effective at securing soft information; but they tend to underemphasize analytical input that is often important as well. The planners and management scientists can serve their organizations effectively by carrying out ad hoc analyses and feeding the results to top management (need I say verbally?), ensuring that the very best of analysis is brought to bear on policy making. But at the same time, planners need to recognize that these inputs cannot be the only ones used in policy making, that soft information is crucial as well.

For the teacher of managers

If the suggestions in this article turn out to be valid, then educators had better revise drastically some of their notions about management education. Consider the revolution in that sphere over the last fifteen years—while it has brought so much of use—h virtually consecrated the modern manageme school to the worship of the left hemisphere.

Should educators be surprised that so many of the graduates end up in staff positions, with no inte tion of ever managing anything? Some of the be known management schools have become virtu closed systems in which professors with little int est in the reality of organizational life teach ine perienced students the theories of mathematics, ec nomics, and psychology as ends in themselves. these management schools, management is accord little place.

I am not preaching a return to the manageme school of the 1950s. That age of fuzzy thinking h passed, thankfully. Rather, I am calling for a ne balance in our schools, the balance that the best human brains can achieve, between the analytic a the intuitive. In particular, greater use should made of the powerful new skill-development tec niques which are experiential and creative in n ture, such as role playing, the use of video-ta behavior laboratories, and so on. Educators need put students into situations, whether in the field in the simulated experience of the laboratory, wh they can practice managerial skills, not only int personal but also informational and decisional. Th specialists would follow up with feedback on t students' behavior and performance.

For managers

The first conclusion for managers should be a c for caution. The findings of the cognitive psych ogists should not be taken as license to shroud tivities in darkness. The mystification of conscio behavior is a favorite ploy of those seeking to prot a power base (or to hide their intentions of creati one); this behavior helps no organization, a neither does forcing to the realm of intuition act ities that can be handled effectively by analysis.

A major thrust of development in our organizatio ever since Frederick Taylor began experimenting factories late in the last century, has been to sl activities out of the realm of intuition, toward c scious analysis. That trend will continue. But m agers, and those who work with them, need to careful to distinguish that which is best hand analytically from that which must remain in the meantime, should be looking for the lost keys to managem

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Remarks: Hank:

Are there other topics which you would like to include in this list?

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EXECUTIVE REGISTRY FILE E-20

DRAFT

27 SEP 1976

Mr. Jerry A. Busch
Director Corporate Planning Staff
Department 03-20
Lockheed Aircraft Corporation
P.O. Box 551
Burbank, California 91520

Dear Jerry:

As we discussed on the telephone yesterday, we would be very interested in hearing from you on the top management/planning process at Lockheed. I would suggest Tuesday, November 9, 1976; Tuesday, November 16, 1976; or Thursday, November 18, 1976, at 4:30 p.m. as possible times. If these are not satisfactory to you, we can consider other possibilities.

As to the session itself, as I mentioned, we are in the midst of a far-ranging review of how we carry out many aspects of our business. We have established an Executive Advisory Group consisting of six top management people here who meet twice per week to discuss policy, organizational, resource, planning, and other general management issues. It has been our thought that it would be useful to sit down from time to time with responsible individuals in industry to hear how they approach these problems, both to expand our horizons and to allow

creative debate. I think the following questions are generally illustrative of our interests and the kinds of topics on which we would most appreciate hearing from you. I know that for the most part they are "unanswerable."

What kinds of issues are systematically reviewed at the top management level?

How do you communicate what you are pursuing to employees?

Do you have a formal staff structure which suggests appropriate topics for top management review, and if so, how does it work?

What does corporate planning at Lockheed involve, how much time do you devote to it, and which aspects of it have you found most useful?

How are fundamental problems which arise within one part of the corporation, but which affect the corporation as a whole, dealt with?

How much time does Lockheed top management spend together as a team, in comparison with the time spent by members of the team in exercising their individual line functions?

Which functions or activities does the top management team reserve to itself and which

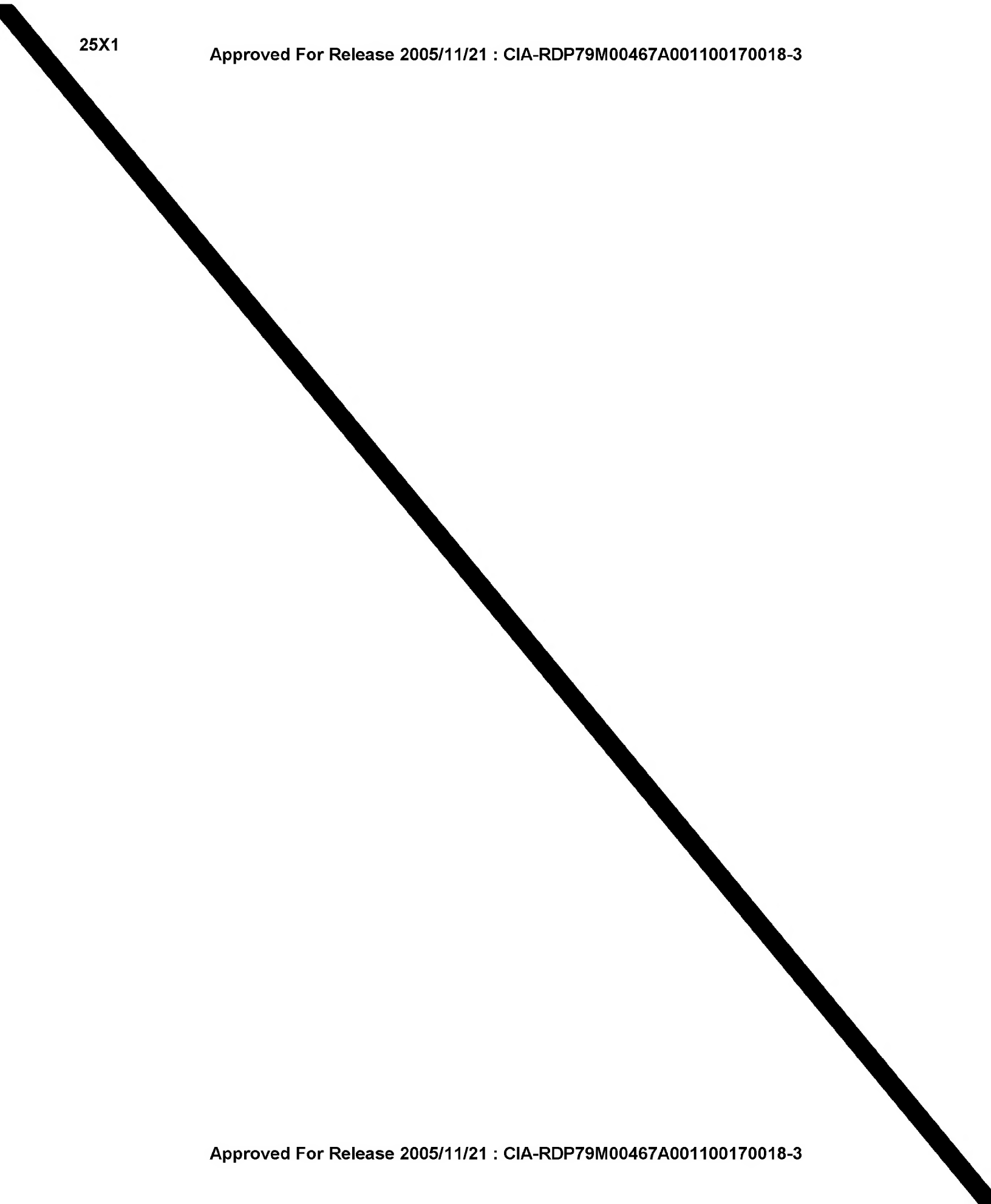
are generally considered line functions to be carried out by operating divisions with minimal high-level review.

Which executive or other positions are regarded as matters of corporate rather than operating division concern, and how do you consider assignments for these key positions?

I think this will give you an idea of the breadth of our interests. If I have touched on any subject you would rather not discuss, please feel free to tell me. Also, I welcome your suggestions concerning other topics that might be of interest to us. I am delighted that you are willing to sit down with us and look forward to meeting you again.

Very truly yours,

James H. Taylor
Comptroller



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